Claims

- 1. A method of producing a plant having increased disease resistance, said method comprising the steps of:
- a) providing a non-naturally occurring plant cell overexpressing a nucleic acid molecule encoding a calcium dependent protein kinase (CDPK) polypeptide; and
 - b) regenerating a plant from said plant cell, wherein said CDPK polypeptide is expressed in said plant, increasing the resistance of said plant to disease as compared to a naturally-occurring plant.
 - 2. The method of claim 1, wherein said plant cell is a dicotyledonous plant cell.
- 3. The method of claim 2, wherein said dicotyledonous plant cell is a cruciferous plant cell.
 - 4. The method of claim 1, wherein said plant cell is a monocotyledonous plant cell.
 - 5. The method of claim 1, wherein said disease is caused by a plant pathogen.
- 15 6. The method of claim 1, wherein said non-naturally occurring plant cell is a transgenic plant cell.
 - 7. The method of claim 6, wherein said transgenic plant cell comprises a transgene that expresses a nucleic acid molecule encoding a CDPK polypeptide.
 - 8. The method of claim 7, wherein said CDPK polypeptide is CDPK2.

- 9. The method of claim 7, wherein said CDPK polypeptide is CDPK4.
- 10. The method of claim 7, wherein said CDPK polypeptide consists essentially of a protein kinase domain.
- 5 11. The method of claim 7, wherein said CDPK polypeptide is a constitutively-active CDPK polypeptide.
 - 12. The method of claim 7, wherein said transgene ectopically expresses said nucleic acid molecule encoding said CDPK polypeptide.
 - 13. The method of claim 7, wherein the transgene comprises an inducible promoter.
 - 14. The method of claim 7, wherein the transgene comprises a constitutive promoter.
 - 15. The method of claim 7, wherein the transgene comprises a tissue-specific promoter.
- 16. The method of claim 7, wherein said nucleic acid molecule is either derived from *Arabidopsis* or is an ortholog thereof.
 - 17. A method of conferring pathogen resistance on a plant, the method comprising the steps of:
- a) crossing a pathogen resistant plant prepared by the method of claim 1 with a
 plant having susceptibility to a pathogen;

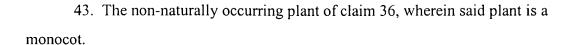
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- b) recovering reproductive material from the progeny of the cross; and
- c) growing pathogen resistant plants from the reproductive material.
- 18. The method of claim 17, said method further comprising repetitively crossing the pathogen resistant progeny with disease susceptible plants, and selecting for expression of pathogen resistance.
 - 19. A method for breeding pathogen resistance into plants, said method comprising:
 - a) selecting a plant that expresses a nucleic acid molecule encoding a CDPK polypeptide; and
 - b) selecting pathogen resistant progeny.
 - 20. The method of claim 19, wherein said plant is a transgenic plant.
 - 21. The method of claim 20, wherein said transgenic plant comprises a transgene that expresses a nucleic acid molecule encoding a CDPK polypeptide.
- 22. The method of claim 21, wherein said transgene ectopically expresses a
 nucleic acid molecule encoding said CDPK polypeptide.
 - 23. The method of claim 21, wherein said CDPK polypeptide is CDPK2.
 - 24. The method of claim 21, wherein said CDPK polypeptide is CDPK4.
 - 25. The method of claim 21, wherein the CDPK polypeptide consists essentially of the protein kinase domain.

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- 26. The method of claim 21, wherein the CDPK polypeptide is a constitutively-active CDPK polypeptide.
- 27. A non-naturally occurring plant that expresses a nucleic acid molecule encoding a CDPK2 polypeptide.
- 5 28. The non-naturally occurring plant of claim 27, said plant comprising a transgene that includes a nucleic acid molecule encoding a CDPK2 polypeptide, expression of said nucleic acid molecule being under the control of an expression control region that is functional in a plant cell.
 - 29. The non-naturally occurring plant of claim 28, wherein the nucleic acid molecule encoding said CDPK2 polypeptide is derived from a plant.
 - 30. The non-naturally occurring plant of claim 28, wherein the CDPK2 polypeptide consists essentially of the protein kinase domain.
 - 31. The non-naturally occurring plant of claim 28, wherein said transgene that encodes said CDPK2 polypeptide is either derived from *Arabidopsis* or is an ortholog thereof.
 - 32. The non-naturally occurring plant of claim 27, wherein said plant is a dicotyledonous plant
 - 33. The non-naturally occurring plant of claim 27, wherein said plant is a monocotyledonous plant.

- 34. A seed from the non-naturally occurring plant of claim 27.
- 35. A cell from the non-naturally plant of claim 27.
- 36. A non-naturally occurring plant that expresses a nucleic acid molecule encoding a CDPK4 polypeptide.
- 5 37. The non-naturally occurring plant of claim 36, said plant comprising a transgene that includes a nucleic acid molecule encoding a CDPK4 polypeptide, expression of said nucleic acid molecule being under the control of an expression control region that is functional in a plant cell.
- 38. The non-naturally occurring plant of claim 36, wherein the nucleic acid molecule encoding said CDPK4 polypeptide is derived from a plant.
 - 39. The non-naturally occurring plant of claim 36, wherein the CDPK4 polypeptide consists essentially of the protein kinase domain.
 - 40. The non-naturally occurring plant of claim 36, wherein the CDPK4 polypeptide is a constitutively-active CDPK4 polypeptide.
- 41. The non-naturally occurring plant of claim 36, wherein said transgene that encodes said CDPK4 polypeptide is either derived from *Arabidopsis* or is an ortholog thereof.
 - 42. The non-naturally occurring plant of claim 36, wherein said plant is a dicot.



- 44. A seed from the non-naturally occurring plant of claim 36.
- 45. A cell from the non-naturally occurring plant of claim 36.
- 5 46. A vector comprising an expression control region functional in plant cells operably linked to a nucleic acid molecule encoding a CDPK4 polypeptide.
 - 47. A vector of claim 46 wherein the CDPK4 polypeptide consists essentially of the protein kinase domain.
- 48. The vector of claim 46 wherein the nucleic acid molecule encoding said CDPK4 polypeptide or protein kinase domain is derived from a plant.
 - 49. The vector of claim 46, wherein nucleic acid molecule encoding said CDPK4 polypeptide is a constitutively-active CDPK4 polypeptide.
 - 50. The vector of claim 46 wherein said nucleic acid molecule that encodes said CDPK4 polypeptide is either derived from *Arabidopsis* or is an ortholog thereof.
- 15 51. A cell comprising the vector of claim 46.
 - 52. The cell of claim 51, wherein said cell is a plant cell.
 - 53. The cell of claim 51, wherein said cell is a prokaryotic cell.